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Air Operating Permit Excess Emissions Report Form Part II

Name of Facility	Shell, Puget Sound Refinery	Reported by	Tim Figgie
Date of notification	April 30, 2010	Incident type: breakdown/ upset/startup or shutdown	Malfunction
Start Date	April 30, 2010	Start Time:	11:45 AM
End Date	April 30, 2010	End Time:	12:20 PM
Process unit or system(s): Plant, HTU/CRU1 and Cogen Fuel Gas Systems			

Incident Description

On April 30, 2010 at about 10:15 AM the H₂S in fuel gas alarmed on the FCCU Operator board. At about the same time FCCU Operators received another alarm for flooding of the deethanizer tower as well as high vapor flow from the deethanizer tower to the amine absorber tower, 4BC30. The deethanizer tower flooding was caused by a failed instrument 4AI102 that determines feed quality to the POLY unit. When this analyzer malfunctioned the automatic control system added heat to the deethanizer tower, resulting in flooding and high gas flow to 4BC30. The high gas flow to 4BC30 caused poor performance of the H₂S absorber tower resulting in high H₂S in the plant fuel gas, HTU1 fuel gas and cogen fuel gas systems. When the cogen operators saw the high SO₂ in the stack analyzers they shut off plant gas flow to the cogen. This back pressured the plant fuel gas system resulting in flaring of sour fuel gas in excess of 500 lbs.

To correct the problem Operators removed heat from the deethanizer tower, increased the amine circulation to the amine absorber tower 4BC30, and added heat to the amine recovery unit #3 to improve amine quality. To prevent a reoccurrence of this event, process control engineers added a protective function to alarm operators in response to a failure of analyzer 4AI102.

AAG was not flared during this event and the 1000-ppm SO₂ corrected to 7% O₂ 1-hour average limit was not exceeded.

Immediate steps taken to limit the duration and/or quantity of excess emissions:

The flare gas recovery unit was operating to recover as much material as possible during this event and operations worked to control the upset as soon as practicable.

Applicable air operating permit term(s):	PSR - 5.1.5, 5.1.7, 5.2.3, 5.3.14, 5.5.4, 5.7.3, 5.8.14 and 5.9.3. Cogen - 5.11 and 5.31.
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Estimated Excess Emissions: Based on SO ₂ CEMS and calculated stack flow	Pollutant(s): SO ₂	Pounds (Estimate): Flare - 624 Fuel Gas - 272
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The incident was the result of the following (check all that apply):

- ☐ Scheduled equipment startup
- ☐ Scheduled equipment shutdown
- ☐ Poor or inadequate design
- ☐ Careless, poor, or inadequate operation
- ☐ Poor or inadequate maintenance
- ☐ A reasonably preventable condition

Did the facility receive any complaints from the public?

- ☒ No
- ☐ Yes (provide details below)

PSR0000509

Air Operating Permit
Excess Emissions Report Form Part II
Page 2

Did the incident result in the violation of an ambient air quality standard

- ☒ No
☐ Yes (provide details below)

Root and other contributing causes of incident:

The root cause of this event was a failed process control analyzer on the Poly unit feed stream. To correct the problem Operators removed heat from the deethanizer tower, increased the amine circulation to the amine absorber tower 4BC30, and added heat to the amine recovery unit #3 to improve amine quality. To prevent a reoccurrence of this event, process control engineers added a protective function to alarm operators in response to a failure of analyzer 4AI102.

The root cause of the incident was:

(The retention of records of all required monitoring data and support information shall be kept for a period of five years from the date of the report as per the WAC regulation (173-401-615))

- ☒ Identified for the first time
☐ Identified as a recurrence (explain previous incident(s) below – provide dates)

Are the emissions from the incident exempted by the NSPS or NESHAP "malfunction" definitions below?

- ☐ No
☒ Yes (describe below)

The root cause of this event was a failed process control analyzer on the Poly unit feed stream.

Definition of NSPS "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or failure of a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 60.2

Definition of NESHAP "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 63.2

Analyses of measures available to reduce likelihood of recurrence (evaluate possible design, operational, and maintenance changes; discuss alternatives, probable effectiveness, and cost; determine if an outside consultant should be retained to assist with analyses):

The root cause of this event was a failed process control analyzer on the Poly unit feed stream. To correct the problem Operators removed heat from the deethanizer tower, increased the amine circulation to the amine absorber tower 4BC30, and added heat to the amine recovery unit #3 to improve amine quality. To prevent a reoccurrence of this event, process control engineers added a protective function to alarm operators in response to a failure of analyzer 4AI102.

Description of corrective action to be taken (include commencement and completion dates):

To prevent a reoccurrence of this event, process control engineers added a protective function in response to a failure of analyzer 4AI102.

If correction not required, explain basis for conclusion:

See above

Attach Reports, Reference Documents, and Other Backup Material as Necessary. This report satisfies the requirements of both NWCAA regulation 340, 341, 342 and the WAC regulation (173-400-107).

Is the investigation continuing? ☒ No ☐ Yes

Is the source requesting additional time for completion of the report? ☒ No ☐ Yes

Air Operating Permit
Excess Emissions Report Form Part II
Page 2

Based upon information and belief formed after reasonable inquiry, I certify that the statements and information in this document and all referenced documents and attachments are true, accurate and complete.

Prepared By: _ Richard Jordan_ Date: _ May 5, 2010

Responsible Official or Designee: *Sam G. Kravitz* Date: *5/27/10*